

## HINTS PROPOSAL

**Proposed Title:** Identifying the Characteristics of Sedentary and Overweight Groups using Signal Detection Methodology

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**Research question:**

1. What are the characteristics of subgroups with high rates of physical inactivity? What communication channels do physical inactive subgroups use?
2. What are the characteristics of subgroups with high rates of being overweight? What communication channels do overweight subgroups use?

**Study description/rationale:**

Physical inactivity and obesity have been linked to increased cancer risk and carcinogenesis for many cancers (Calle et al., 2003, IARC, 2002). It has been noted that physical inactivity or sedentarism may be conceptually and empirically distinct from physical activity (Lee & King, 2003; Prochaska et al, 2000). Furthermore, those who are physically inactive may not represent just one group, but instead may consist of several subgroups. Those who are overweight can also be divided into subgroups that share important characteristic. Despite the wealth of research on physical activity, the identification of discrete subgroups at risk for physical inactivity has received only cursory attention and the subgroups have typically been divided only along one dimension (e.g., gender). Further delineation of the subgroups among multiple characteristics is needed to develop effective interventions. In addition, the communication channels most used by subgroup with high proportions of physical inactivity and/or adiposity have not been well researched. Delineating critical communication pathways to reach these subgroups can also have important implications for the development of health promotion interventions.

Signal detection methodology is an analytic approach that can identify subgroups of individuals who are homogeneous in both outcome and key characteristics (Kiernan et al, 2001; Kraemer, 1992). The subgroups identified are mutually exclusive and maximally discriminated from each other with respect to a specific dichotomous outcome. Signal detection methodology is ideal for use in hypothesis-generating activities and when higher order interactions among variables are possible in exploratory analyses.

The importance of this proposal topic area is highlighted by the growing obesity epidemic in the United States, and from results of national surveys that find 24%-28% of U.S. adults are completely sedentary in their discretionary time (CDC, 2000, 2003; U.S. Department

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of Health and Human Services, 1996); significantly higher inactivity rates (35%-40%) are found among certain segments of the populations (e.g., ethnic minorities, older adults). It is also important to note that one of the major goals of the IOM 2003 report – Fulfilling the Potential of Cancer Prevention and Early Detection – is the development of obesity and sedentary behavior prevention strategies (IOM, 2003).

The purposes of the present study will be to (1) identify the various subgroups with high prevalence rates of physical inactivity and obesity, (2) explore the demographic, psychological, and health characteristics of the subgroups, and (3) examine the communication channels utilized by these subgroups.

### **Variable List:**

#### Primary Outcomes:

EX-1 AnyExercise

HW-1 Height\_Inches, HW-2 Weight

#### Predictors:

HE-12 SPAGE

HE-14 SPGender

HS-1 GeneralHealth

HS-2 Depression

HS-5 HealthInsurance

DM-1 MainActivity

DM-2 MaritalStatus

DM-3 Children

DM-4 Hispanic

DM-5 Race

DM-6 Education

DM-7 Income

EX-3 ExerciseLowerCancer

FV-1 Fruits

FV-2 FruitJuice

FV-3 Vegetables

CH-1 EverHadCancer

HC-1 UsualProvider

HC-5 Cable

HC-6a WatchTV

HC-6b ListenRadio

HC-7a ReadNewspaper

HC-7b ReadMagazine

HC-8a AttendTV

HC-8b AttendRadio

HC-8c AttendNewspaper

HC-8d AttendMagazine

HC-8e AttendInternet

HC-20 UseInternet

CK-8 ChanceGetCancer

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CK-9 WorryGetCancer

## Method of Analysis:

Signal Detection Methodology will be used to examine the research questions proposed. The sample will be randomly divided in half. Signal Detection Methodology will be used on the first half the sample; ANOVA procedures will be used on the second half of the sample to validate the results of the Signal Detection Analyses. With the ANOVA procedure to validate results, separate groups (e.g., 2 high subgroups, 2 low subgroups) will be created in the second half of the sample based on the critical variable cut points found in the signal detection analysis. The physical inactivity (obesity) rates in these subgroups for the second random sample will be compared to see if the subgroups identified in the first sample can be replicated.

Signal detection is used with recursive partitioning, an empirically driven iterative nonparametric process, to produce a series of “and/or” (Boolean) rules on the predictor variables that identify subgroups of individuals who are more or less likely to have a particular outcome according to a selected criterion (Kraemer, 1992). The partitioning process is set up to identify sets of predictors that would optimize both sensitivity and specificity in predicting those who are inactive (or overweight). The stopping rules include the following: no evaluation with fewer than 10 participants in a subgroup and a .05 significance level at each step.

We will also conduct additional descriptive analyses of the subgroups identified in the signal detection analyses, focusing specifically on communication channels. Other demographic and health characteristics will also be examined in these descriptive analyses.

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**Targeted Journal:** TBD

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